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# OVERVIEW OF ACTIVITIES CONDUCTED DURING THE ARES-III AND LEARN ANALOG MISSIONS IN THE LUNARES HABITAT

**Abstract**

Technical progress is being made on human Lunar and Martian missions by space agencies and private organisations around the world, with the aims of establishing a reliable long duration architecture. Complementing this, research is being carried out under controlled and isolated conditions within simulated space habitats, to gain insights into the effects of such conditions on research subjects, and in turn, their impacts on the crews' wellbeing and success of the mission. This paper will provide an overview of the experiments conducted during two separate 15-day missions, conducted in isolation in the LunAres Research Base in Piła, Poland, in 2018: Ares-III, a Mars analog mission, and LEARN, a Lunar analog mission. Some activities were common between the two crews, others were only carried out by one. Using the same methodology, both crews collected cognitive function, environmental, physiological, and inventory data; resulting in a larger dataset, and also permitting comparisons to be made between the two missions in terms of varying human factors. Experiments conducted only by the LEARN crew included: the effects of consuming only lyophilised food on oral health and saliva production, the influence of isolation from the noises of everyday life on hearing capability, feelings on security in the isolated habitat, and research into earthworm growth in different soil compositions. The Ares-III mission analysed the physical performances of the crew during the two weeks, which is compared to the performances realised during similar activities in several Mars Research Desert Station (MDRS) missions. The Ares-III crew also studied the impact of confinement on their efficiency when performing a remote operation of a rover. For each piece of research, an overview of the background, methodology, and, where appropriate, results, and conclusions will be given, referencing the resulting papers. In addition, non-research activities will be outlined. These, while not yielding scientific outcomes, are included for completeness and for context.